

## ON THE APPLICATION OF SITUATIONAL TEACHING IN HIGH SCHOOL MATHEMATICS TEACHING

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### ABSTRACT

This paper introduces the meaning and main characteristics of situational teaching, explains the principles and ways of creating teaching scenarios in theory, and uses the examples of creating teaching scenarios in senior high school curriculum as an auxiliary demonstration. All of these fully confirm the importance of situational teaching in middle school mathematics teaching, hoping to promote the development of teaching work.

**Keywords:** Situational teaching, High school math, the teaching application.

### INTRODUCTION

The traditional idea of exam-oriented education for college entrance examination has long lagged behind, and the teaching of mathematics course with teachers, books and exercises as the core and the purpose of high-score examination has been totally unable to meet the needs of the progress of the times and the development of the country. Innovative science and technology urgently need creative and flexible thinking talents. In the past, it was very difficult to cultivate students' innovative and practical abilities by focusing only on their academic achievements and neglecting their all-round development in mathematics teaching<sup>[1]</sup>. If the teacher is only a one-sided injection of teaching methods, for a long time, high school students in rebellious adolescence will not be able to actively learn, thinking about problems will become worse, will not find and explore problems, completely do not know the fundamental practical significance of learning mathematics.

The application of mathematics is not only the application of mathematical knowledge, but also the application of mathematical thought. The ultimate goal of mathematics education is: after one learns mathematics, even if his future work has nothing to do with mathematics, one should observe the world with a mathematical perspective, analyze the world with mathematical thinking and express the world with mathematical language, because abstraction makes mathematics general, reasoning makes mathematics rigorous, and model makes the application of mathematics extensive. That is to say, the student union has the ability of mathematical abstraction, logical reasoning and mathematical modeling<sup>[2]</sup>.

Therefore, to train innovative talents with logical mind, abstract thinking and innovative practical consciousness, situational teaching mode emerges as the times require. By introducing mathematical knowledge through abundant situational examples, students are guided to apply mathematical knowledge to solve practical problems, and mathematics knowledge is closely linked with reality. In the process of mathematics teaching in middle schools, teaching quality is improved, students' acquisition of knowledge is ensured, so that students can integrate into the

teaching situation and study under the influence of teaching situation, so as to improve their own mathematical thinking ability and mathematical application ability.

## THE MEANING AND CHARACTERISTICS OF SITUATIONAL TEACHING

The so-called situational teaching is a kind of teaching method through creating realistic and helpful mathematical situations for teaching activities<sup>[3]</sup>. Under the guidance of teachers, students actively explore the unknown mathematics, actively think and cooperate to study and solve it. It can help students reduce their strangeness to abstract mathematics knowledge and acquire real mathematics knowledge and ideas that can be applied to social life. Its three characteristics are:

(a) To be affectionate and student-centered

Different from the traditional education tradition of "achievement first", situational teaching based on emotion aims to arouse students' thirst for knowledge in inquiry learning of mathematics. It repeatedly emphasizes that students are the main body in teaching activities, and teachers are only guides to help students learn to think mathematically when facing problems.

(b) Enliven the atmosphere, the effect is obvious

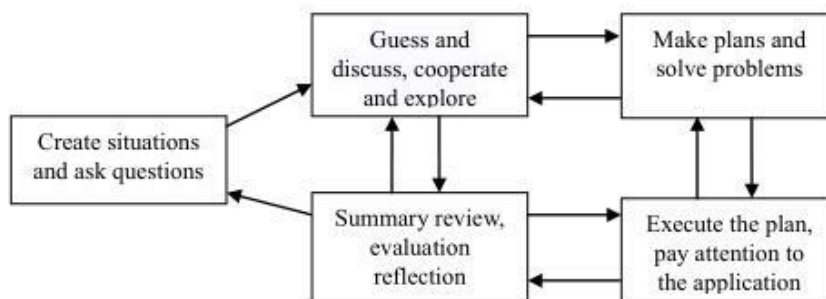
Combine the theoretical knowledge of mathematics with the actual life, and create a specific situation that can stimulate students' active learning towards the direction of promoting students' personal development. Mathematics teaching in middle school emphasizes the creation of mathematical situation, which is based on Situational Cognition and knowledge theory. It helps students to have the sense of cooperation and exploration, so that the content of mathematics teaching can be displayed from shallow to deep in front of students. Situational teaching can stimulate learning initiative better than boring and simple teaching methods, and the classroom atmosphere is better, and the learning effect is more obvious.

(c) Innovation and breakthrough, harmony between teachers and students

Based on the real needs of students, the experience of mathematical situation enables students to participate in the classroom independently. The essence is to optimize the thinking situation through innovative design of teaching elements. Rich and novel teaching situation is also the link and carrier of harmonious and mutually advancing relationship between teachers and students.

## PRINCIPLES AND APPROACHES FOR CREATING SITUATIONS

The activity cycle mode of high school mathematics situational teaching is as follows:



The links of this kind of teaching mode are interrelated. The teaching of learning mathematics knowledge or solving mathematics problems starts from creating problem situations. The problems put forward are also presented in a new mathematical situation in front of the students. The students realize that they are facing such problems and want to solve them, so they enter the process of guessing, questioning and exploring independently. In order to clarify a mathematical problem,

students seek clues, organize information and make representations from the situation of the problem. At the same time, teachers give some guidance. In the process of making plans, students will find that they need to understand the problem better and apply it to the basic knowledge of mathematics they have learned. This process continues until they get the correct answer. This may also become the starting point of the next new mathematics problem solving teaching, and then infer the unknown from the known. In such a cycle, the causal relationship between mathematical knowledge points is deeply rooted in students' minds, and the logical thinking of mathematics and the ability to solve mathematical problems independently will be improved.

There are two principles to be satisfied in creating mathematics teaching situation<sup>[4]</sup>:

- (a) Expanding students' mathematics knowledge and improving students' mathematics ability are the criteria to promote the teaching of mathematics in classroom. The selected mathematics situation should have certain teaching value level.
- (b) Reflecting the important and difficult points of teaching content, it fully combines mathematics knowledge and life reality, and the difficulty is appropriate and clear.

The ways to create situations in high school mathematics teaching are as follows:

- (a) According to the characteristics of middle school students' psychological development and the existing life experience, teachers should put forward the situation problems of arousing their desire for learning knowledge, including the mathematics knowledge they have learned and the practical problems they have encountered in life. To enable students to actively analyze mathematical problems from the mathematical knowledge they have learned or the practical problems they often encounter in their lives, to make efforts to learn and try, and to integrate smoothly into the situation of learning new knowledge.

For example, although the expression of binomial theorem is a little complicated, it is widely used in our daily life. Teachers can introduce new lessons with examples of bank deposits when explaining: Ms. Zhang deposits 10,000 yuan in the bank, if the annual interest rate is 0.9%. What are the principal and interest earned by her in two years, three years and ten years? (Accurate to 0.01) To deposit in the bank is a necessary thing in life. The situation in this case not only creates a deposit situation for students to ask questions, but also eliminates the strangeness by familiarizing them with such situation, so that they can use the listed mathematical expressions to derive binomial theorems and form a certain sense of application.

- (b) Look for hot topics or fashion trends to design the teaching situation of mathematics. Nowadays, most middle school students are in a restless adolescence. They love fashion and chase all kinds of entertainment stars and sports stars. Consider designing these elements in the teaching situation, so that the monotonous questions become rich and colorful, so that they can fully feel that the original mathematics can be so interesting.

For example, before explaining the abstract concept of probability of random events, the shooting competition pictures of Emmons and Zhanbo Jia in the Olympic Games were given through setting up the situation. It is well known that this is a highly ornamental sport. Among the first nine shootings, Emmons scored 9.9 rings at the lowest, up to 10.8 rings, with a fairly high hit rate. Ask the question, "Can you predict that his 10th shot will be more than 9?" Prediction is indispensable in life, and it exists everywhere. Weather forecast is a kind of forecast. It may or may not rain the next day. Then such events are random events.

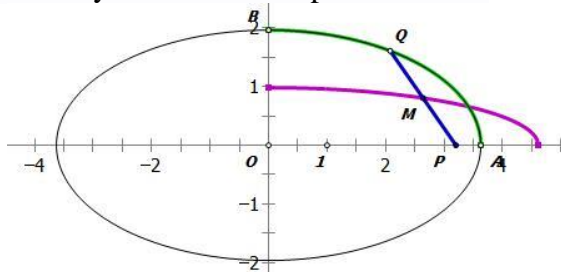
The way the problem goes from shallow to deep. On the basis of recognizing the concept of randomness, students can comprehend the occurrence and regularity of random events from living examples. This class is a seemingly "boring" mathematics concept course, but choosing situational teaching method, seizing the characteristics that many students like to pay attention to the Olympics and sports, arousing students' curiosity and thirst for knowledge by using classical sports event cases that students are interested in. Reflect everywhere in life there is mathematics, to achieve the teaching objectives of this lesson.

(c) Using physical objects, models, charts and other vivid descriptions of mathematical theory, showing the relationship between mathematical models. Students can intuitively discover the rules in the situation, prompt ideas for finding answers to questions, and strengthen the training of observation ability and spatial imagination in close connection with teaching content.

For example, when reasoning and demonstrating the nature of plane parallelism, students first explore independently in groups, put forward their own ideas, and then demonstrate with the prepared cuboid model, the upper and lower two bottom planes are parallel, and the third plane is inserted in the middle. The line intersecting with two parallel planes has no common point and excludes the situation of different planes, and then conclude that the intersection line is parallel. The surface parallel to the line parallel to restore in life, can let students observe a wall in the classroom and the ceiling and the ground intersection line is parallel. Give full play to the main role of students in the classroom, inquiry learning of new knowledge can improve students' classroom participation and enthusiasm for learning, students participate in the classroom, integrated in the context of thinking, can deepen the understanding of the nature of the theorem.

(d) Make full use of modern teaching methods such as slides and computer software, in order to give students a more intuitive presentation of abstract mathematical knowledge to highlight the focus of mathematical knowledge. Transformations such as linear programming scatter plots, stereographs, conic curves and function images are made to flip and fold. These images, which are not concepts in the minds of students, vividly and vividly simulate the dynamic graphics to make the students observe them carefully. The modern intuitive scene greatly reduces the difficulty of understanding and truly breaks through the difficulties of learning<sup>[5]</sup>.

For example, "The length of a known line segment PQ is equal to the length of the short axis of a known ellipse. The point Q moves on the arc of the ellipse in the first quadrant, and the point P moves forward on the X axis. The trajectory of the midpoint M of the line segment PQ is obtained. Teachers can use the Geometric Sketchpad to simulate the following animation. By changing the position of P and Q to observe the trajectory of M point, and then check the trajectory equation obtained by the correlation point method.



It should be noted that when the images of each demonstration change, teachers should let students try to describe, summarize, describe and summarize the rules according to the observed situation. It is much better than telling them the calculation method to memorize by rote. Whenever they

need to apply it, they will think of the graphics they have seen, which will help to understand and consolidate knowledge.

## CONCLUSION

In the process of mathematics teaching, we should correctly understand the "situation", which is an essential component of teaching, and we should not ignore the importance of guiding students to experience the learning process of analysis, prediction and discovery in mathematics. Just like telling a story, you can't tell people the time, place, people and main events directly, and then let them talk about their feelings. In order to make others familiar with the story and feel the same, you need the descriptor to talk from beginning to end.

As a teacher, it is a great responsibility to carefully design the situation of introducing questions into the classroom. The situation designed in each class must highlight the teaching center, arrange the link time, and avoid the students to emit some ideas unrelated to the classroom. To ensure that students are the main body of the classroom, teachers effectively guide students to abstract problems combined with teaching situations with simple mathematical symbolic language comprehension summary. The situation chosen in each class should not be too singular. Considering the needs of students' internal development, we should know that there are many kinds of ways to create situations. Such as, to explain geometric problems, we can not only simulate the relationship between points, lines and surfaces by using the seewo whiteboard, but also make students understand by folding a triangle in person. Therefore, teachers' gestures, computer software and experimental games are all situational means to develop students' mathematical application ability and broaden their thinking. What to choose requires careful consideration by teachers.

Improvement of mathematical ability and situation construction of new mathematical knowledge throughout the teaching process, so that seemingly only forty-five minutes of mathematics class into students' expectations, it is worth the students can actively learn mathematics after class, enriched mathematical paradise.

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